Equator for RISE

Creator Manual

February 2016
Version 1.7.2

New in This Version

Tempo Sync
New Sample Format
Appendix for Adding Own Samples

ROLI

Introduction

Hello creator, and welcome to the Creator Manual about the Equator software synthesiser that comes with your Seaboard RISE. We think of the people who buy and use ROLI's products as creators more than customers. Our products are designed to expand the bandwidth of creative expression and thereby empower people as the creators they are. Everyone who buys and uses a Seaboard RISE is investing in this vision of creativity and therefore is also a co-creator of ROLI.

You may already be exploring Equator and discovering its creative possibilities. This comprehensive Creator Manual explains all of the details about Equator to ensure that you get the most out of it.

Equator is ROLI's custom-built, multidimensional software synthesiser and sound engine. Equator and Seaboard instruments work together to provide a seamlessly integrated hardware-software experience. With its blend of subtractive, sample, and FM synthesis and its focus on the modulation of multiple parameters in real time, Equator is a flexible and highly expressive synthesiser. It works as a standalone OS X and Windows application and as a plugin for a suite of industry-standard DAWs.

On the next page we have included a short list of terms specific to Equator and Seaboard instruments. We will refer to these terms throughout the Creator Manual.

Please note that this is a digital manual updated regularly to reflect software updates and other improvements. Be sure to check for updates on My ROLI. This Manual is current up to **Equator** v1.7.2, **ROLI Dashboard** v3.1.5, and **RISE** Firmware v1.1.2.

Support and Feedback

We want you to have the best experience possible with your Seaboard, and our Support team is here to help you. Should you have any questions, are experiencing any problems, or have any feedback to give us about our products,please don't hesitate to get in touch.

You can contact us through our Support page at www.roli.com/support or by writing us directly at support@roli.com. We will respond as soon as possible. The resources on the Support page should also help answer many questions.

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Selected Equator for RISE Terms

Keywave surface: The entire playing surface including all **keywaves** and ribbons. The **keywave surface** corresponds to a keyboard.

Keywave: A wavelike element of the **keywave surface** that corresponds to a single key on a standard keyboard. Each of the **Five Dimensions of Touch** can be accessed on a single **keywave**.

Equator: ROLI's custom-built, multidimensional software synthesiser and sound engine. **Equator** enables refined control of the expressive capabilities of the keywave surface. **Equator** and **Seaboard** instruments work together to provide a seamlessly integrated hardware-software experience.

MPE: Multidimensional Polyphonic Expression (**MPE**) is a protocol for using standard MIDI messages to communicate with and enable the operation of multidimensional instruments such as the **Seaboard RISE**. **MPE** enables multidimensional devices like the Seaboard to control multiple parameters of every note independently such as pitch, timbre and other nuances when used within **MPE**-compatible software like **Equator**. **MPE** accomplishes this by spreading MIDI data that pertain to each note across a range of MIDI channels and reserving one channel (usually the lowest) for global MIDI messages such as program change, pedal, and fader positions. These global messages affect all notes equally.

Expression Mode: A mode of playing the **Seaboard RISE** in which three **Touch Faders** control the dynamics of the **Glide**, **Slide**, and **Press** dimensions of touch. **Expression Mode** lets you modify the touch responsiveness of the **Seaboard RISE** to suit specific sounds and your individual playing style.

Expression Curves: The graphical curves in **ROLI Dashboard** that represent the behaviour and sensitivity of the **Five Dimensions of Touch**

The Five Dimensions of Touch (5D Touch): The five fundamental elements of physical interaction between a finger and a surface: **Strike**, **Press**, **Glide**, **Slide**, and **Lift**.

- **Strike:** The velocity and force with which a finger makes contact with a **keywave**.
- **Press:** The pressure and continuous touch applied to the **keywave** after the initial **Strike.**
- **Glide:** Horizontal movements from side to side on a **keywave** and left right movement along the ribbons.
- **Slide:** Vertical movements up and down a **keywave**.
- **Lift:** The release velocity or speed of liftoff from a **keywave**.

MIDI CC Mappings: Mappings that determine which MIDI Continuous Controller messages will be sent from the three **Touch Faders** and XY Touchpad.

MIDI Mode: A mode of operation in which the **Touch Faders** can be assigned to any MIDI CCs for additional customisation of sound.

Modulation Panel: A panel on the main view of **Equator** that lets you change the settings for the **RISE** controls, the **Five Dimensions of Touch**, LFOs, envelopes, and keytracking.

ROLI Dashboard: An application for modifying and customising the internal settings of the **RISE**.

Touch Fader: A control for adjusting the sensitivity of the **keywave surface** to dimensions of touch.

1. Getting Started

1.1 System Requirements

OS X

- Mac OS 10.8+
- Minimum RAM: 4GB
- Recommended RAM: 8GB
- Processor: 2.5GHz i5 or faster
- Bluetooth connectivity: OS 10.10+

Windows

- Windows 7, 8, or 10
- Minimum RAM: 4GB
- Recommended RAM: 8GB
- Recommended Processor: i5 and equivalent or above

1.2 The Seaboard RISE Software Bundle

Before making music on your **Seaboard RISE** and **Equator**, you need to download the **Seaboard RISE** Software Bundle. This software bundle is available on My ROLI. Please follow the instructions below. If you have already installed the **Seaboard RISE** Software Bundle you can skip to "2. Hardware".

1.3 Register on My ROLI

Visit my.roli.com and sign up with a username and password of your choice. When you have signed up and logged in, the website will ask you to register your product. Use your Product Registration Code. The code is printed on the Registration Card. This card is in the box marked *Make Music Now*, which comes in the package with your **RISE** (see Figure 1).

Figure 1

Pick up your Registration Card and find your registration code. Visit this web page to sign up for My ROLI, your portal for software downloads and product support, with a username and password of your choice. Then register using your registration code.

Login and Download ROLI Software

Now that you've created an account on My ROLI, you can log in and download **Equator** for **RISE** and **ROLI Dashboard**, the two applications included in the software bundle. Click either "Download Software Bundle for Mac" or "Download Software Bundle for Windows" depending upon which operating system you use.

1.4 Installation Mac & Windows

When the download is complete, open the installer from the Downloads folder on your computer. Follow the on-screen instructions and choose the location or disk where you want to install the software. The install will require approximately 2.5 GB of disk space.

Mac: After double-clicking the installer, you may see a message that says the installer is from an "unidentified developer." Don't worry. The software is safe to install. You can bypass this message by right-clicking the installer from a Finder window and selecting Open.

Windows: Right-click on the installer zip file and click on "Extract all". This will create a new folder next to the zip file which contains the unzipped items. Double-click the installer inside the new folder to begin the installation.

You may see a message that says Windows has protected your PC by stopping an "unrecognised application" from opening. Don't worry. The software is safe to install. You can bypass this message by clicking "More Info" on the message, then clicking the "Run Anyway" button.

Equator will by default install as a standalone app in the Applications folder. It will also install as a plug-in in the following folders:

Mac OS X

- Macintosh HD/Library/Audio/Plug-ins/VST
- Macintosh HD/Library/Audio/Plug-ins/Components
- Factory Presets are saved in: Macintosh HD/Users/ Shared/ROLI/Equator for RISE/ Factory Library/Presets
- User Presets are saved in: ~/Documents/ROLI/ Equator for RISE/ Presets

Presets and a copy of this manual will be saved in the following folder: ~/Documents/ROLI/Equator for RISE

Windows 32 bit

- C:/Programfilesx86/VST Plugins
- Factory Presets are saved in the following folder: C:/ProgramData/ROLI/Equator for RISE/ Factory Library/Presets/
- User Presets are saved in the following folder: C:/Users/[User]/Documents/ROLI/Equator for RISE/Presets

Presets and a copy of this manual will be saved in the following folder: ~This PC/Documents/ROLI/Equator for RISE

Windows 64 bit

- C:/Programfiles/VST plug ins
- Factory Presets are saved in the following folder: C:/ProgramData/ROLI/Equator for RISE/ Factory Library/Presets/
- User Presets are saved in the following folder: C:/Users/[User]/Documents/ROLI/Equator for RISE/Presets

Presets and a copy of this manual will be saved in the following folder: ~This PC/Documents/ROLI/Equator for RISE

2. Overview and Layout

Figure 2

Above, the main view of **Equator for RISE**.

Above is the main view of **Equator** (see Figure 2), showing the Synth Panel at the top half of the screen and the **Modulation Panel** at the bottom half of the screen.

The Navigation Bar at the very top of the screen shows a range of available settings including presets and Audio/MIDI settings.

While this view shows the Synth Panel, the top half of the **Equator** screen can show either the Synth Panel, the Mixer Panel, or the Global Panel. You can toggle between them. The Synth Panel gives you access to the parameters of the modules in the signal chain. The Mixer Panel routes, configures and mixes these modules. The Global Panel gives you access to "per-preset" settings such as Voice mode. More information about these panels is found in this section, Section 3, and Section 6.

In the lower half of the screen are two modulation views. While this view shows the **Modulation Panel**, the bottom half of the screen can show either the **Modulation Panel** or the Modulation List. You can toggle between them. The **Modulation Panel** gives you access to multiple modulation sources and their parameters. It also lets you create modulation paths quickly. You can view all of these paths in the Modulation List. More information about these panels is found in Section 5 and 7.

2.1 The Navigation Bar

The following icons are located in the top right corner of the Navigation Bar:

Compare: This icon compares an original preset with changes to that preset. Click and hold the icon to preview your changes to the preset.

Master Volume: In the standalone application of **Equator**, this slider adjusts the overall output level of the instrument. This parameter is not saved in the presets. Double clicking on the volume fader resets the volume level to its default position.

MIDI Panic: This button will clear the MIDI buffer and remove any active notes. Click the button to reset stuck notes and unusual MIDI messages.

Equator Menu: This icon takes you to **Equator** functions including New, Save As, Undo/Redo, and the Audio and MIDI Settings.

Preset settings in the Navigation Bar

The Navigation Bar displays the current preset in the center of the bar (In Figure 2 above, the preset is "Smoky Rhodes"). Arrows on either side let you quickly switch presets. Clicking on the preset also brings up the Preset Browser window, which we explain in detail in Section 2.3.

2.2 Interacting with Equator

Changing Parameters

In any panel of **Equator**, you can change parameters by manually adjusting a dial on the screen or typing in the numerical value of the parameter (see Figure 3).

- Navigate to the parameter.
- Click on the dial to adjust the base value.
- Hold down the cmd (Command) key while clicking on the inner circle of the dial for fine adjustment.
- Alternatively, click on the numerical field underneath the dial and type in the numerical value of the parameter.
- Double click inside the inner circle of the dial to reset the parameter to its default value

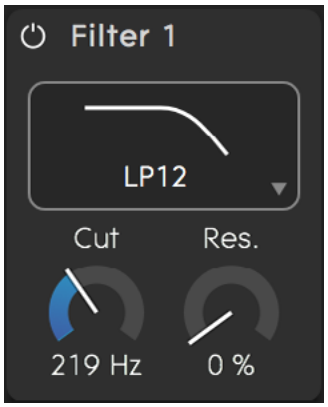


Figure 3

An example of a modulation panel in **Equator for RISE**.

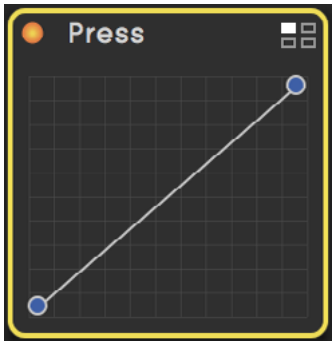


Figure 4

An orange border indicates that a modulation source is selected.

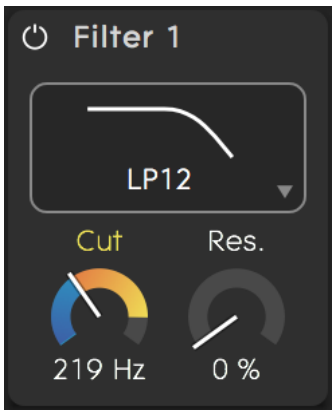


Figure 5

The orange, outer circle of a dial adjusts the modulation depth for a parameter.

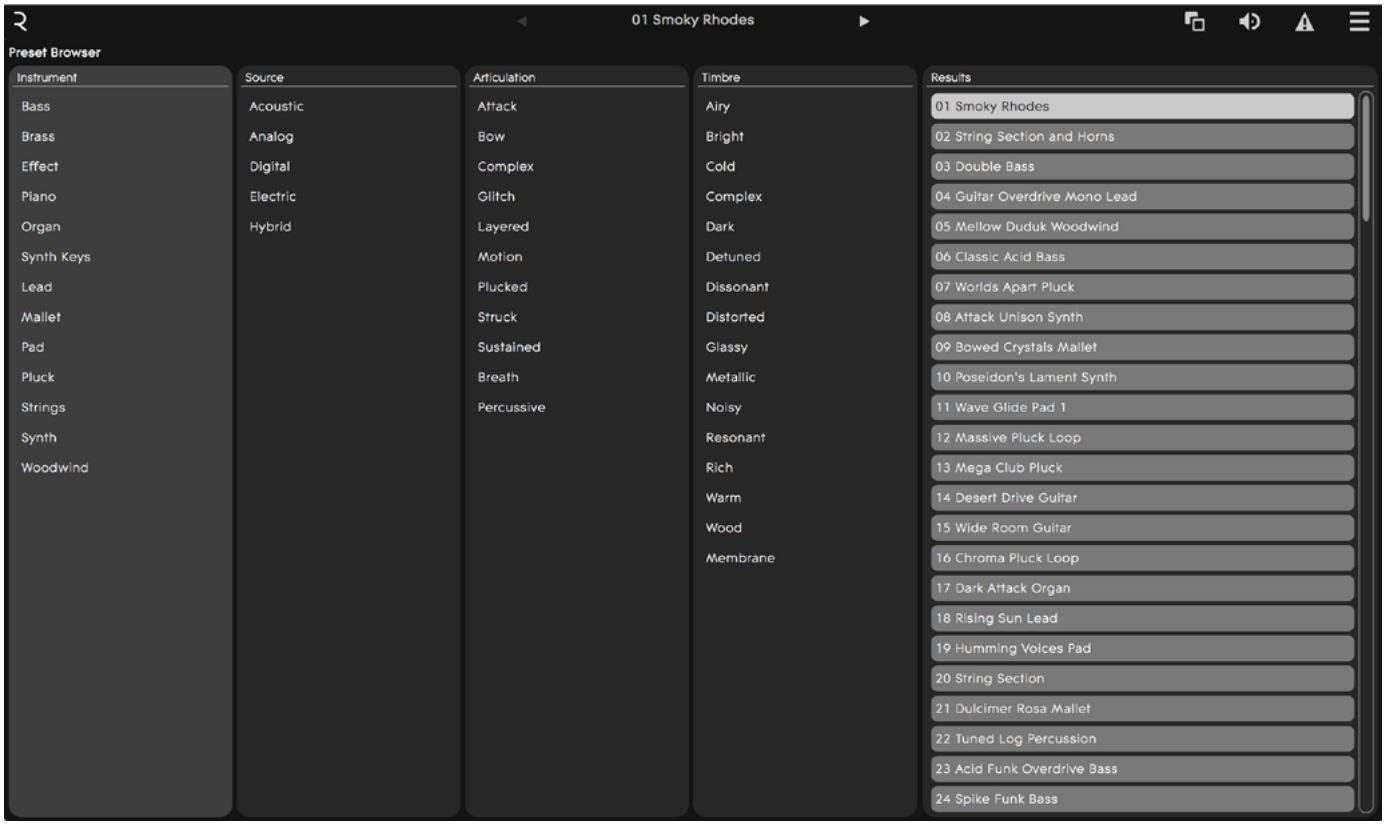


Figure 6

Above, the Preset Broswer in **Equator for RISE**.

Modulating Parameters

You can quickly modulate parameters in the main view of **Equator** by setting a modulation source. Follow these steps:

1. Select the modulation source by clicking on it. When activated, the box containing the modulation source will be highlighted in an orange border. (see Figure 4).

2. Drag the outer circle of the dial to adjust the modulation depth for that parameter. An orange arc will appear on the dial showing the value of the parameter you are modulating (see Figure 5).

   Modulation can be both positive and negative.

   Double clicking in the outer circle will reset the modulation amount.

2.3 Preset Management

Changing Presets

Open the Preset Browser by clicking on the preset name in the center of the Navigation Bar. Single click the preset name to load the preset (see Figure 6).

Filtering Presets

Narrow down your presets by selecting tags in each of the four categories of Instrument, Source, Articulation and Timbre.

Saving Presets

Save your presets by clicking Save As in the **Equator** menu. The tags that you assign to each preset help you discover the preset within the Preset Browser.

When you save a preset, the positions of the three **Touch Faders** and the XY Touchpad are also stored. When using Equator as a plug-in, it is not guaranteed that these stored positions will be send back to the RISE when recalling a preset.

Note: When you edit a Factory Preset and select "Save", you will be prompted to "Save As" because the Factory Presets cannot be overwritten. However, selecting "Save" after editing a user preset will immediately overwrite the user preset. Be sure to select "Save As" if you wish to preserve your original and store the new preset.

3. The Synth Panel

The Synth Panel shows **Equator**'s primary sound generation and sound shaping tools. These include three oscillators, two stereo Sample Playback Modules, a Frequency Modulation Module, a Noise Generator, five filters, and six effects (see Figure 7).

Figure 7

Above, the Synth Panel in **Equator for RISE**.

3.1 Oscillators

You can set the three wavetable oscillators (see Figure 8) to waveforms including classic analogue waves (pulse, sine, square, triangle and sawtooth) and multiple complex waveforms.

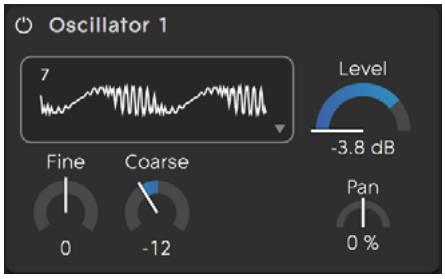


Figure 8

An oscillator in **Equator for RISE** showing a complex waveform.

The following parameters are available for each oscillator:

- **Level:** -∞ to 0dB
- **Pan:** Full Left to Full Right
- **Fine Pitch:** -99 to +99 Cents
- **Coarse Pitch:** -48 to +48 Semitones
- **Width:** Changes the pulse width of the pulse waveform (0% to 100%)

3.2 Frequency Modulation (FM) Module

Using the FM tool, you can set the output of one oscillator to modulate the frequency of another. This changes the timbre. The four available FM configurations are shown in (see Figure 9).

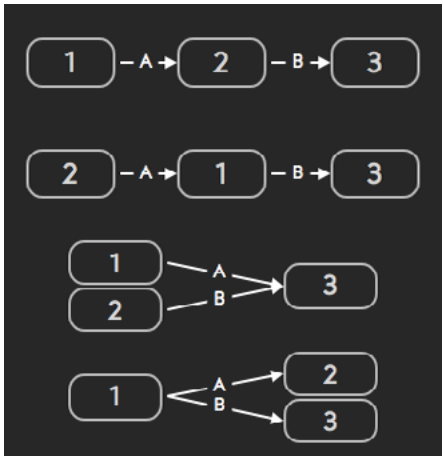


Figure 9

FM configurations in **Equator for RISE**.

For each configuration you can control the modulation depth through Depth A and B dials (see Figure 10).

3.3 Sample Playback Module

The two Sample Playback Modules contain many preinstalled samples ranging from acoustic instruments to synthesised and layered sounds (see Figure 11).

The following parameters are available for each Sample Playback Module:

- **Level:** -∞ to 0dB
- **Pan:** Full Left to Full Right
- **Fine Pitch:** -99 to +99 cents
- **Coarse Pitch:** -48 to +48 semitones
- **Filter parameters** (see Section 3.5)

**Note: It is possible to extend the factory content with additional samples. Please see Appendix A for details.*

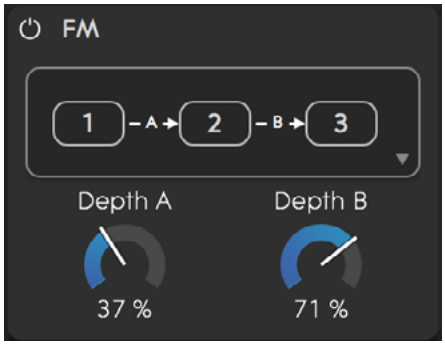


Figure 10

The Frequency Modulation (FM) Module in **Equator for RISE**.

3.4 Noise Generator

The Noise Generator outputs either stereo white noise or stereo pink noise with adjustable stereo width and a dedicated filter section (see Figure 12). The following parameters are available:

- **Noise type:** White or Pink
- **Level:** -∞ to 0dB
- **Stereo Width:** 0% (Mono) to 100% (Stereo)
- **Filter parameters** (see Section 3.5)

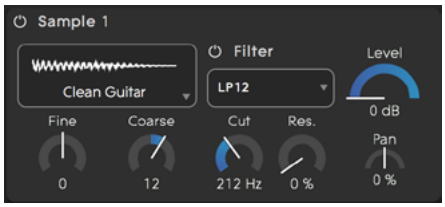


Figure 11

The Sample Playback Module in **Equator for RISE**.

3.5 Filters

Equator contains five identical filters (see Figure 13). Two filters are assigned to the Sample Playback Modules, one is assigned to the Noise Module, and two are used for general routing. Set the routing of these two filters in the Mixer Panel (see Section 5.2). All filters can be modulated.

The following filter types are available for the five filters:

Classic Analogue Filter Types

- Low-pass 12dB/octave
- Low-pass 24dB/octave
- Band-pass
- Notch
- Hi-pass 12dB/octave
- Hi-pass 24dB/octave
- Comb Filter

Standard Programmable Digital Filter Types

- State-variable low-pass 12dB/octave
- State-variable band-pass 12dB/octave
- State-variable high-pass 12dB/octave
- State-variable low-pass 24dB/octave
- State-variable band-pass 24dB/octave
- State-variable hi-pass 24dB/octave

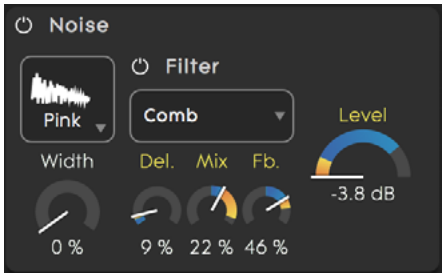


Figure 12

The Noise Generator panel in **Equator for RISE**.

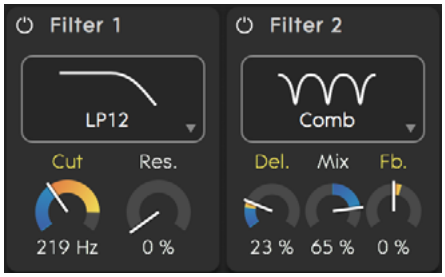


Figure 13

The Filters panel in **Equator for RISE**.

The low-pass, high-pass, band-pass and notch filters have the following parameters:

- **Cut-off (or Center Frequency) of the chosen filter:** 20Hz to 15kHz
- **Resonance:** 0% to 100%

The Comb Filter has a different set of parameters:

- **Delay:** the length of the delay line (ms)
- **Mix:** the amount of delayed (wet) signal added to the input (dry) signal (can be positive or negative)
- **Feedback:** the amount of delayed signal fed back to the input of the delay line (can be positive or negative)

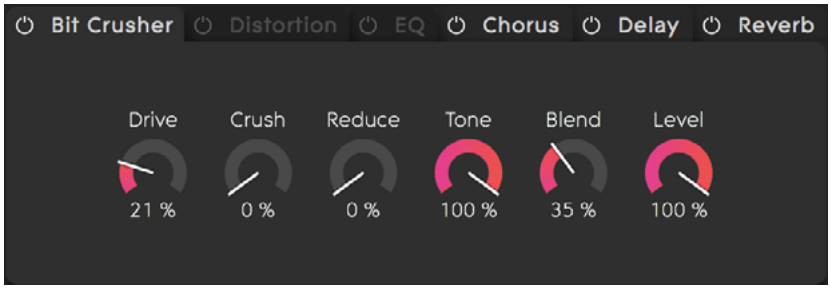


Figure 14

The Bit Crusher panel in **Equator for RISE**.

4. Effects

The effects section in **Equator** contain the following stereo effects in series:

- **Bit Crusher**
- **Distortion**
- **EQ**
- **Chorus**
- **Delay**
- **Reverb**

The effects section comes at the end of the signal chain. It is global for all voices.

4.1 Bit Crusher

(see Figure 14)

The following parameters are available in Bit Crusher:

- **Drive** controls the amount of waveshaping. Lower settings can be used to add warmth. Higher setting will result in an overdriven or distorted sound.
- **Crush** controls the effective bit depth of the signal. Higher settings will result in lower resolution and therefore more quantising.
- **Reduce** controls the amount of sample rate reduction. Higher settings will result in less treble and more aliasing distortion.
- **Tone** controls the overall colour of the wet signal.
- **Blend** controls the relative amount of the dry and wet signal.
- **Level** controls the overall level of the effect.

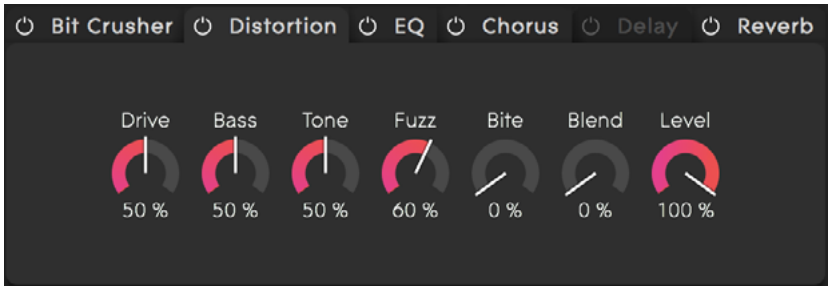


Figure 15

The Distortion panel in **Equator for RISE**.

4.2 Distortion

(see Figure 15)

The following parameters are available in Distortion:

- **Drive** controls the amount of distortion.
- **Bass** controls the amount of low-frequency boost.
- **Tone** controls the overall color of the wet signal. Higher settings will result in a harsher sound.
- **Fuzz** controls the amount of even harmonics. Higher settings will result in a dirtier sound.
- **Bite** controls the amount of mid-frequency boost.
- **Blend** controls the relative amount of the dry and wet signal.
- **Level** controls the overall level of the effect.

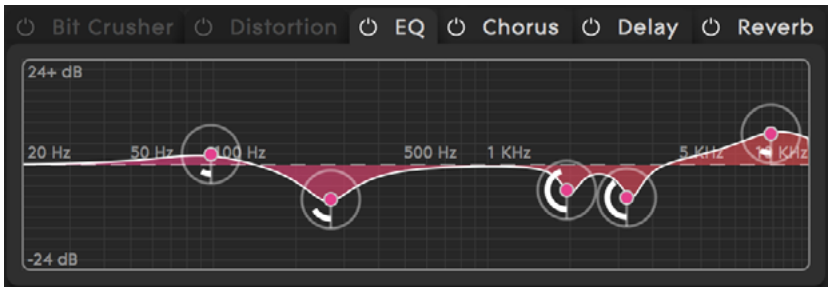


Figure 16

The EQ panel in **Equator for RISE**.

4.3 EQ

(see Figure 16)

The EQ section is a five-band parametric equaliser. Each band has the following parameters:

- **Gain:** -24dB to +24dB
- **Center Frequency:** 20Hz to 15kHz
- **Q factor:** this parameter adjusts the bandwidth of the bell shape. High Q means lower bandwidth.

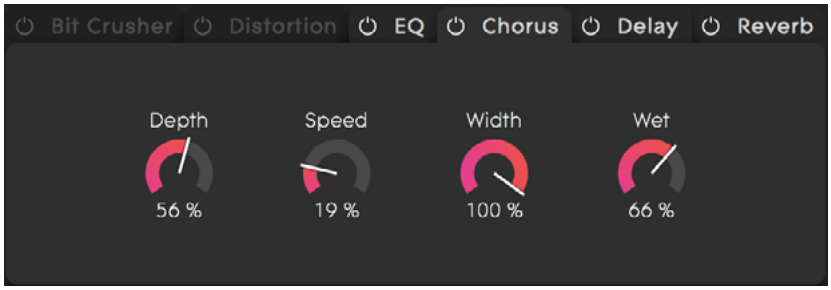


Figure 17

The Chorus panel in **Equator for RISE**.

4.4 Chorus
(see Figure 17)

The following parameters are available for the stereo Chorus:

- **Depth** controls the amount of pitch modulation applied by the effect (0% to 100%).
- **Speed** controls the rate of pitch modulation (0.2Hz to 50Hz).
- **Stereo Width** controls the width of the stereo field of the effect (0% [Mono] to 100% [Stereo]).
- **Wet** controls the amount of processed signal added to the dry signal (0% to 100%).

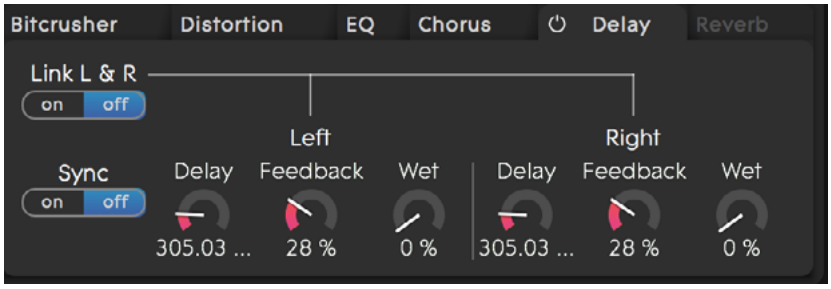


Figure 18

The Delay panel in **Equator for RISE**.

4.5 Delay
(see Figure 18)

Delay consists of two independent delay lines (left and right). The following parameters are available for each channel:

- **Delay Time** controls the length of the delay (time between the input signal and the repeated signal). If "Sync" is disabled, the delay time can be set in milliseconds (from 0 to 2000). If "Sync" is enabled the delay time can be set as time signatures (1/4, 1/8, etc.) based on the current Master Clock settings.
- **Feedback** controls the amount of processed signal fed back to the input of the delay line (0% to 100%). The lowest setting will result in repeating the input signal only once while higher settings will introduce more repeats.

- **Wet** controls the amount of processed signal added to the dry signal (0% to 100%).

- **Link L & R**: If enabled parameter changes made on one side will also apply to the other.

- **Sync:** If enabled, delay time will be based on the Master Clock settings. This is useful if you want the delay to follow the BPM setting of your DAW project or to keep the delay in sync with the envelopes or LFOs.

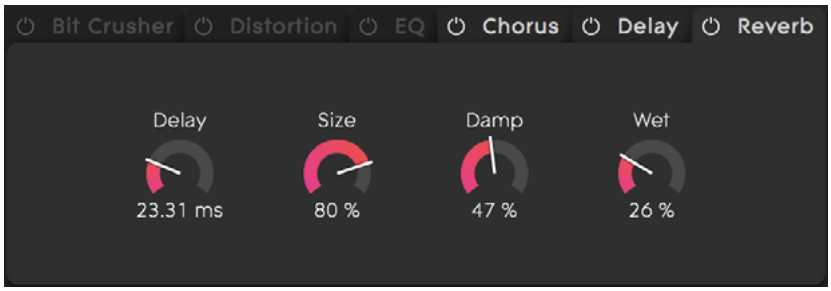


Figure 19

The Reverb panel in **Equator for RISE**.

4.6 Reverb
(see Figure 19)

The stereo Reverb has the following parameters:

- **Pre-delay** controls the delay between the direct signal and the reverberant signal (0 to 100ms).

- **Size** controls the reverb time of the reverberant signal (0% to 100%).

- **Damp** controls the amount of low-pass filtering (absorption) applied (0% to 100%).

- **Wet** controls the amount of processed signal added to the dry signal (0% to 100%).

Figure 20

Above, the Mixer Panel in **Equator for RISE**.

5. Mixer

5.1 Sends

The Mixer Panel (see Figure 20) routes the output of each audio source (Oscillators, Sample Playback Modules, Noise Generator, Ring Modulator*) independently to any of the following destinations:

- **Filter 1**
- **Filter 2**
- **Effects Section (EQ, Chorus and Delay)**
- **Reverb**
- **Main Output**

**The Ring Modulator multiplies the outputs of Oscillator 1 and 2.*

5.2 Filter Configuration

The routing of Filter 1 and Filter 2 can be configured in the following ways:

- **Serial:** Filter 1 feeds into Filter 2. In this configuration the Sends to Filter 2 are disabled.
- **Parallel:** The signal flow of Filter 1 and Filter 2 are separate and their outputs can be mixed separately.
- **Summed:** Filter 1 and 2 are parallel but their outputs are summed together.
- **Mixed:** Filter 1 has its own output but also feeds into Filter 2.

The controls below each filter output set the output level feeding into the effects, reverb and main output.

5.3 Output Gains

You can vary the overall gain going to the effects, reverb and main output with the final dials in the signal chain.

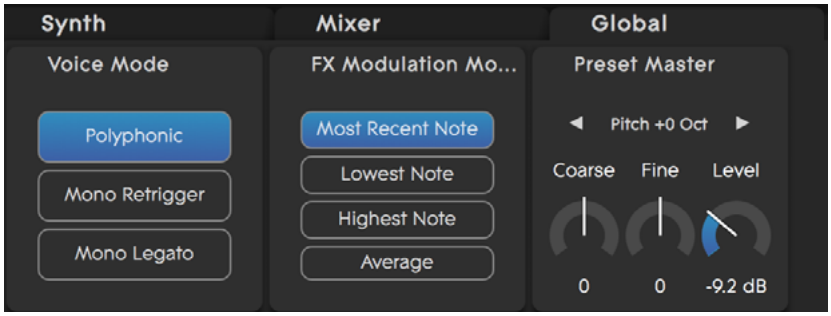


Figure 21

The Global Controls tab in **Equator for RISE**.

6. Global Controls

The Global tab (see Figure 21) lets you access controls that are global to the current preset. These include:

6.1 Master Clock

The master clock affects the time parameters of envelopes, LFOs and delay if the corresponding 'Sync' switch is enabled.

- **Internal: Equator's** internal clock is used as a master clock. The tempo can be set by repeatedly clicking on the "Tap Tempo" button at the desired rate or manually by clicking on the arrow buttons.

- **External:** this mode can be used to synchronise **Equator's** clock to external devices. Currently, this is only supported in the plug-in version, which can use the tempo set in the host application (DAW).

6.2 Voice Mode

- **Polyphonic:** Maximum of 16 voices with a new active note triggering each voice.

- **Mono Retrigger:** Monophonic (one voice) with a new active note retriggering all envelopes.

- **Mono Legato:** Monophonic (one voice) with all envelopes only retriggered when there are no active notes.

6.3 FX Modulation Mode

FX Modulation Mode controls how the effects (which are global to all voices) react when modulated by per voice modulation sources such as **Strike**, **Press**, **Glide**, **Slide**, and **Lift**.

- **Most Recent Note:** The last voice activated modulates the effect.

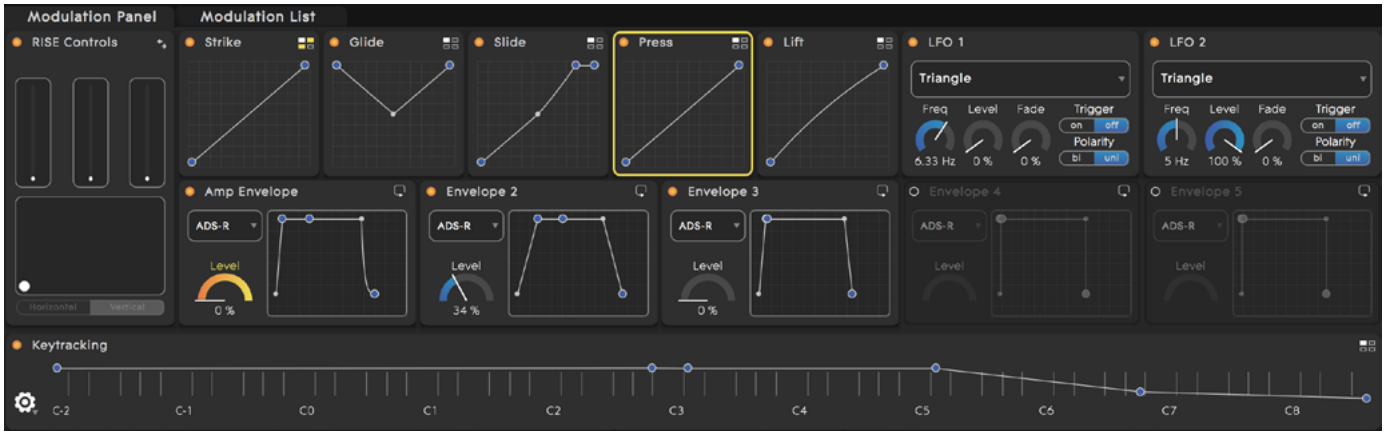
- **Lowest Note:** The lowest pitched note activated modulates the effect.

- **Highest Note:** The highest pitched note activated modulates the effect.

- **Average:** The average of all voices modulates the effect.

6.4 Preset Master

- **Octave Shift** shifts the pitch by octave steps (+/- 3 octaves).
- **Coarse Pitch** adjusts the overall pitch of the preset (+/- 11 semitones).
- **Fine Pitch** adjusts the overall pitch of the preset (+/- 99 cents).
- **Preset Level** adjusts the level of the preset (-∞ to +6dB).



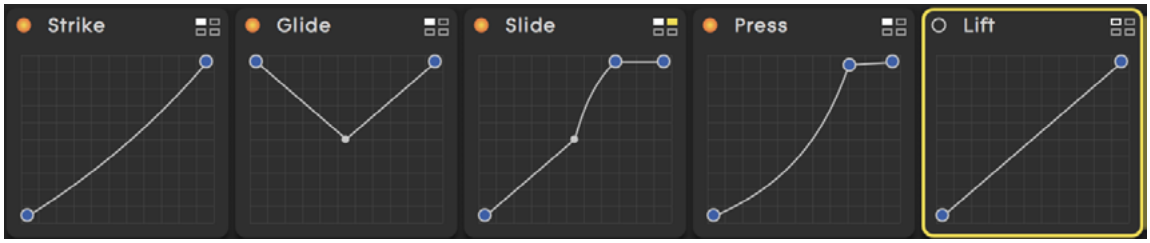
7. Modulation

Figure 22

Above, the **Modulation Panel** in **Equator for RISE**.

The Modulation section in the lower half of **Equator** (see Figure 22) makes it easy to shape sounds and apply modulation to different parameters. The sources of modulation include:

- **The Five Dimensions of Touch (Strike, Press, Slide, Glide, and Lift)**
- **RISE Controls**
- **Envelopes**
- **Low Frequency Oscillators (LFOs)**
- **Keytracking**



7.1 The Five Dimensions of Touch

Figure 23

Above, the **Five Dimensions of Touch.**

The **Seaboard RISE** is a multidimensional instrument that lets you modulate sound through five dimensions of touch (see Figure 23). Through simple movements and gestures, you can shape sound easily and discover new modes of expression. The **Five Dimensions of Touch** are:

Strike: The velocity and force with which a finger makes contact with a **keywave**. This dimension of touch corresponds to **Strike** on a standard keyboard.

Press: The pressure applied to the **keywave** after the initial **Strike**. The **keywaves** respond to each moment of continuous touch, transmitting minute variations of

pressure to sound. This continuous pressure-sensitivity allows for swells, fades, and other detailed expressions.

Glide: Horizontal left and right movements on a **keywave** and left right movement along the ribbons. **Glide** movements bend and adjust pitch as naturally as on a string instrument, allowing effects such as vibrato and glissando, all on a polyphonic basis. **Glide** is typically assigned to pitch, but it can be assigned to other sound parameters.

Slide: Vertical movements up and down a **keywave**. You can assign **Slide** to most sound parameters in **Equator**. For example, an upward movement can open a filter that turns an organ sound into a brassy sound, while a downward movement can close the filter. Your initial point of contact with the **keywave**, no matter where this point is, becomes the basis for sound modulation on the Y axis above and below that point.

Lift: The release velocity or speed of liftoff from a **keywave**. You can assign **Lift** to most sound parameters in **Equator**. For example, different speeds of lift can create a lingering resonance or a hard pluck.

7.2 Transfer Curves for 5D Touch

Each of the **Five Dimensions of Touch** has four independent transfer curves that you can assign to different modulation destinations. These act like master controls with individual transfer curves available in the modulation list view. Use the transfer curves to fine-tune the responsiveness of each dimension of touch. To select one of the four curves, click on the icon in the top right-hand corner of the box for **Strike**, **Press**, **Glide**, **Slide**, and **Lift**. Then click on the curve you wish to use (see Figure 24).

For each source, you can add points along the transfer curve by double-clicking on the curve. This can be used to create unipolar responses and more complex transfer curves. To remove a point, just double-click on the one that needs removing.

7.3 RISE Controls
(see Figure 25)

The **RISE** Controls feature lets you map the **Touch Faders** and XY Touchpad to any of **Equator**'s assignable parameters while in **MIDI Mode**. Refer to the **Seaboard RISE** Creator Manual for details about the **Touch Faders**, XY Touchpad, and **MIDI Mode**.

The Switch View button (in the top right-hand corner of the **RISE** Controls section) displays the assignable macros (see Figure 26). Macros can be assigned to MIDI CC messages of any external MIDI controller connected to Equator. Macros default to these settings:

Macro 1: RISE Glide (Left) Fader
Macro 2: RISE Slide (Middle) Fader
Macro 3: RISE Press (Right) Fader

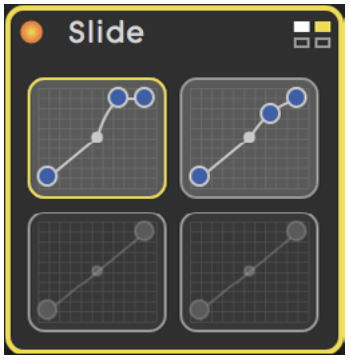


Figure 24

The **Slide** panel in **Equator for RISE**.

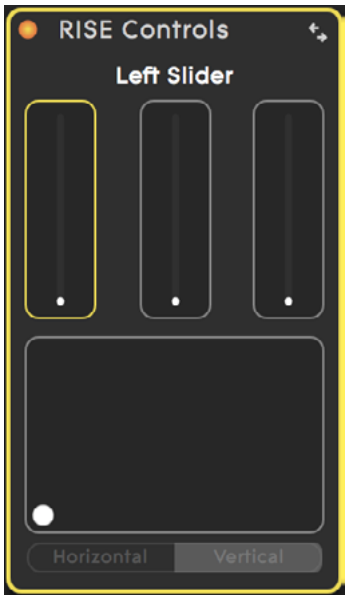


Figure 25

RISE Controls in **Equator for RISE**.

Figure 26

The Macros panel in **Equator for RISE**.

Macro 4: RISE XY Touchpad X Axis
Macro 5: RISE XY Touchpad Y Axis
Macro 6: Assignable
Macro 7: Assignable
Macro 8: Assignable

The MIDI Learn button automatically assigns **Equator** parameters to external controls from **Seaboard RISE** and other compatible MIDI controllers. To do this, click the button and then manipulate the external control.

7.4 Envelopes 1–5

Equator has five independent envelopes. You can view them as a curve or a dial (Curve View and Dial View). To switch between the two views click on the icon in the top right-hand section of the envelope panel (see Figure 27).

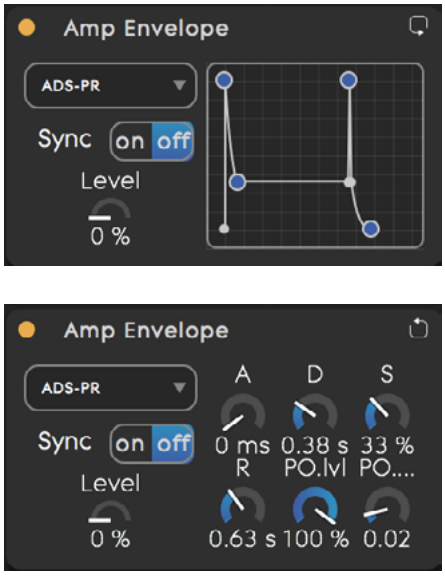


Figure 27

Top, Amp Envelope Curve View.
Bottom, Amp Envelope Dial View.

The following envelope types are available:

- **ADS-R:** This mode works as a typical ADSR envelope. Hitting a note triggers the Attack-Decay-Sustain section. Releasing the note triggers the Release section.

- **ADR (one-shot):** The Attack-Decay-Release section is played once without pause even if the note has not been released.

- **ADADR (looped):** The Attack-Decay section is repeated until you release the note, triggering the Release section. In this mode, the envelope operates as an LFO with a shape defined by the Attack/Decay settings:

  Fast Attack: fast repeat note
  Slow Attack: slow repeat note
  Fast Decay: fast repeat note
  Slow Decay: slow repeat note

- **ADS-PR (pluck-off):** Acts like an ADSR envelope, but when you release a note the envelope will rise to a set level and width before the release section. You can use ADS-PR to simulate gestures and sounds such as the fingers muting a plucked string.

For each envelope the following parameters are controllable and can also be modulated:

- **Level:** 0% to 100%

- **Attack Time:** 0–5 seconds if 'Sync' is disabled, otherwise in time signatures based on the Master Clock settings

- **Decay Time:** 0–5 seconds if 'Sync' is disabled, totherwise in time signatures based on the Master Clock settings

- **Sustain Level:** 0% to 100%

- **Release Time:** 0–5 seconds

- **"Pluck Off" Level:** 0% to 100%. This parameter only works when using ADS-PR.• **"Pluck Off" Width:** 0–2 seconds. This parameter only works when using ADS-PR.

The **Sync** switch determines whether the Attack and Decay times should be based on the Master Clock settings. This is useful if the Attack/Decay times should follow the BPM setting of your DAW project or you want to keep an envelope in sync with the Delay, the LFOs, or with other envelopes.

By default the envelope lines for Attack, Decay and Release increase and decrease at a constant rate. By clicking and dragging above and below each line, however, you can change the curve and therefore the response.

Note: The difference between envelope modes is:

- *The dial envelope can be used to modulate its ADSR stages but this can not be achieved in the graphic envelopes.*

- *The graphic envelope can be used to set the exponential, linear, or logarithmic curves. This can't be done in the dial envelope mode.*

7.5 LFO 1–2

(see Figure 28)

The two independent Low Frequency Oscillators (LFOs) have the following waveforms available:

- **Square**
- **Rising sawtooth**
- **Falling sawtooth**
- **Sine**
- **Triangle**
- **Random (Smooth Waveform)**
- **Random (Sample and Hold) / (Stepped Waveform)**

Each LFO has the following additional parameters:

- **Frequency:** 0 to 10 Hz if 'Sync' is disabled, otherwise in time signatures based on the Master Clock settings

- **Level:** 0% to 100%

- **Fade In:** This determines the time it takes for the level of the LFO to rise from zero to the desired level (0–5 Seconds)

- **Sync:** This parameter determines whether the Frequency should be based on the Master Clock settings. This is useful if you want the LFO to follow the BPM setting of your DAW project or to keep an LFO in sync with the Delay, the envelopes, or with the other LFO.

- **Trigger:**
  On: the LFO for each voice is retriggered when the voice becomes active
  Off: the LFO is free running, meaning the LFOs across all voices are in phase

- **Polarity:**
  Bi: the output of the LFO is bipolar
  Uni: the output of the LFO is unipolar

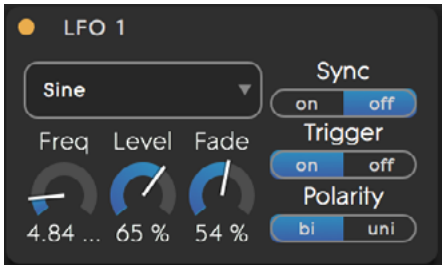


Figure 28

The LFO panel in in **Equator for RISE**.

7.6 Keytracking

Each **keywave** displays the current note being played. You can also use each **keywave** as a modulation source to perform keytracking on a parameter. When you double-click anywhere on the curve you will add nodes, and you can then use those nodes to edit the slope of the curve (see Figure 29).

Figure 29

Above, Keytracking in **Equator for RISE**.

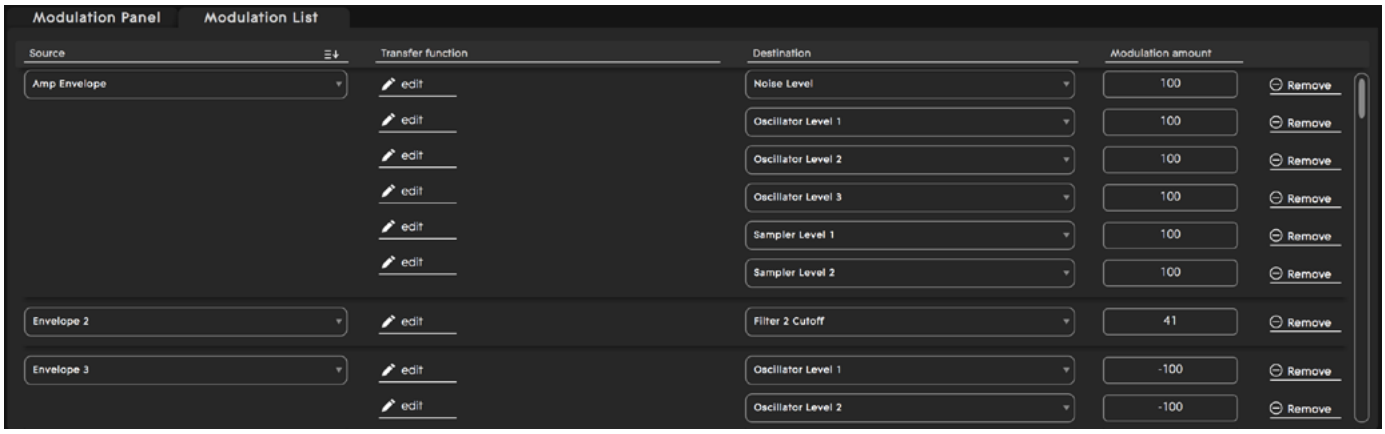
Figure 30

Above, tracking multiple keys.

Equator allows up to four independent sources for keytracking, and each can have its own response (see Figure 30). The button at the top right-hand corner of the keytracking section lets you switch between four different assignments for keytracking.

Four modes are available for each keytracking source. The modes change how keytracking behaves as a modulation source when each is applied with another source to a modulation destination (for example, keytracking and **Press** applied to the Filter 1 Cut-off). These modes are:

- **Add:** Keytracking is added to all other connected modulation sources.
- **Scale:** Keytracking scales the effective value of all other modulation sources.
- **Limit MAX:** Keytracking sets the maximum modulation depth of all other modulation sources. The modulated parameter cannot exceed the value set by keytracking.
- **Limit MIN:** Keytracking limits the minimum modulation depth of all other modulation. The modulated parameter cannot go below the value set by keytracking.



7.7 Modulation List View

Figure 31

Above, the Modulation List in **Equator for RISE**.

The Modulation List (see Figure 31) shows all modulation paths of the preset you are using. You can edit each path and create new ones. The structure of the Modulation List is shown below:

- **Source** lists all modulation sources used in the preset you are using. You can change the modulation source for a group of paths by opening up the drop-down menu for each source and choosing from the list of available modulation sources. Sort the list of modulation paths by clicking on the source selection header.

- **Transfer function** adjusts the transfer between a modulation source and a destination to have a non-linear response. Click on the Edit icon to access this function.

- **Destination** lists all modulation destinations used in the current preset. You can change the destination for each modulation path by clicking on the drop-down menu and selecting from the list of available destinations. Sort the list of modulation paths by clicking on the destination section header.

- **Modulation amount** determines the modulation depth of the corresponding path. To edit the depth, double-click and enter the new value. Or click and drag up or down in the box.

- **Remove** deletes the modulation path. The Remove icon is at the far right side of each row.

New Modulation Paths can be added by scrolling to the bottom of the list and clicking on the "Select New Source" or "Select New Destination" box.

8. Equator Menu

Clicking the far right icon in the Navigation Panel opens up the **Equator** Menu (see Figure 32), giving you access to the preset management, editing, remote updates, and the Audio and MIDI settings.

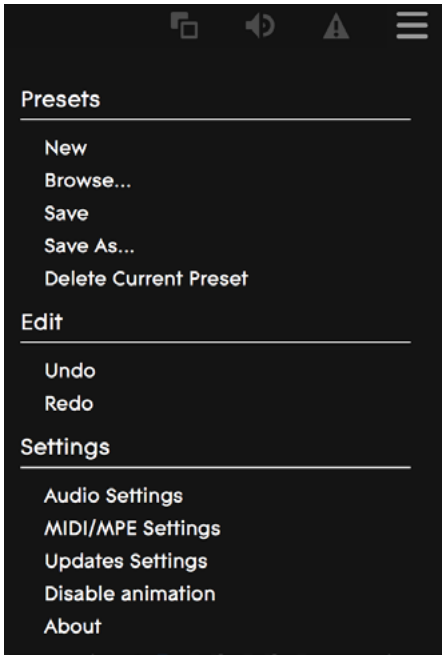


Figure 32

The **Equator** Menu.

Figure 33

The Audio Settings Menu.

Presets

- **New** reverts the synth to the Init (Initial) preset, letting you build a patch from scratch.
- **Browse** opens up the browser windows, where you can search all presets through the tags you have chosen to identify them.
- **Save** (Mac: cmd+s, PC : ctrl+s) saves the changes to the current preset and the values of the three **Touch Faders** in standalone mode only.
- **Save As** allows presets to be named and tagged.
- **Delete Current Preset** deletes the currently selected preset.

Edit

- **Undo** (Mac: cmd+z, PC: ctrl+z) will undo the last change made to a preset in standalone mode only.
- **Redo** (Mac: cmd+y, PC: ctrl+y) will redo the last undone change made to a preset in standalone mode only.

Settings

- **Audio Settings** (see Figure 33) lets you adjust the audio output device, the output channels used, the sample rate, and the buffer size. (This menu is not available when using **Equator** as a plug-in, because audio settings are managed by the host.)
- **MIDI/MPE Settings** (see Figure 34)

  MPE Mode: When MPE is "On", "Channels From" determines the range of channels that **Equator** will receive note data from. This range determines the expressive polyphony of the **RISE**. The global channel is always one channel lower than the range that is set. MIDI data received on the Global channel will affect all voices in **Equator** equally. The default mode for this is:

  Global Channel = MIDI Channel 1
  Note Channel Range = MIDI Channels 2–16

  By selecting MPE "Off", **Equator** will receive note data on any of the MIDI channels selected in the range. If all voices need to be affected, MIDI data needs to be sent on all channels. This

mode needs to be selected if you wish to use Equator with a single channel MIDI controller. The default for this mode is:

Channel Range = MIDI Channels 1–16

Note Pitch Bend: Selects the pitch bend range that individual notes in Equator for RISE will respond to. This value should be matched with your MPE controller. For the **RISE 25**, **RISE 49** and **Equator**, the default is +/48 semitones. Values between 12 and 96 in one octave increments can be selected for optimising with third party controllers.

Global Pitch Bend: When MPE mode is switched on, Global Pitch Bend sets the range if **Equator** receives a pitch bend value on the Global Channel. When receiving this message, it will affect all voices.

MIDI Inputs: Auto Connect to **RISE** when this option is selected, the **RISE** will automatically be connected to **Dashboard** when it shows up in the list of MIDI inputs.

Send Sensitivities to RISE: When this option is selected, any presets saved with the position of the **RISE** sensitivity **Touch Faders** (**Glide**, **Slide**, and **Press**) will transmit these positions to the connected **RISE**. Turning this will mean your current expression settings will be applied to any preset you select.

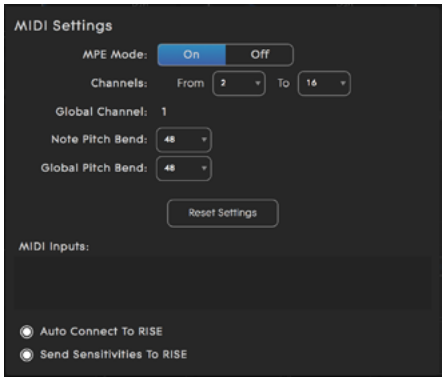


Figure 34

The MIDI/MPE Settings Menu.

- **Updates Settings** lets you check to see if your version of Equator is up-to-date or if there is an update available for you to download and install.

- **Disable/Enable Animation** lets you disable or enable the waveform and modulation graphical animations within Equator.

- **About** shows you the version number of **Equator** that you are using. It also links you directly to ROLI Support

9. ROLI Support

The **Seaboard RISE** Creator Manual and other resources on My ROLI should help answer questions about the initial set-up of **Equator** and your **Seaboard RISE**. Visit our Support page at www.roli.com/support for a wider range of resources that should help answer questions about **Equator** and the **Seaboard RISE**. The page includes frequently asked questions, tutorial videos, and guides for connecting the **RISE** with third-party plug-ins and DAWs.

9.1 Contact our support team

Contact the ROLI support team directly on www.roli.com/support for any questions. We will respond as soon as possible. Our support team is here to help you.

Appendix A. Using Your Own Samples in Equator

From **Equator for RISE** 1.7.0, a new sample format has been introduced that allows users to add their own samples into **Equator**. To achieve this, **Equator** supports a subset of the familiar SFZ format. The SFZ format is an open standard, using a simple text file to define the triggering of samples and how they are played. **Equator's** user sample support will develop over time, but this first implementation allows users already familiar with creating their own sample packs to easily port their favourite samples into their new favourite synth. For users not experienced with creating their own samples packs, the SFZ format is also simple to implement. The following instructions detail how to integrate additional samples into **Equator** and the features of the SFZ format supported by **Equator**.

To integrate your own samples into Equator, you will need two things:

- Your own set of samples (a collection of audio files)
- **An SFZ file:** a text file describing three things:
    - Which audio files are triggered
    - When are they triggered
    - How are they played (e.g. with or without looping)

Note: The SFZ file needs to be an ASCII text file with the .sfz extension

How to Write an SFZ File

Let's say you have only one sample, flute_A3.wav, which is a 440 Hz flute sound. You want to trigger this whenever the A3 key is hit. Here's your SFZ file:

```
<region> sample=flute_A4.wav  key=69
```

You can specify a keyzone by the `<region>` keyword (this should be on a new line). Everything until the next occurrence of `<region>` belongs to the same keyzone.

Use `sample=myfilepath` to specify the triggered audio file for a keyzone. The file can be WAV, AIFF, or FLAC. It can also be in a different folder, use a relative path, e.g. `sample=./subfolder/flute_A4.wav`

Use `key=note_number` to define which key should trigger the current keyzone.

Make sure to avoid spaces when writing keywords and their values, for example: `key=69` is good but `key =69` or `key= 69` or `key = 69` is not.

Extend Your Range

So far, only one note can be triggered by only one MIDI note. The range of one sample can be extended so that a range of MIDI notes causes the sample to be triggered (with the correct tuning).

```
<region> sample=flute_A4.wav  pitch_keycenter=69  lokey=0  hikey=127
```

Use `pitch_keycenter=note_number` to specify the pitch of your audio file. If this is incorrect, everything will be out of tune.

Use `lokey` and `hikey` to specify the range of notes that will trigger your audio file.

`key=69` (from the previous section) is equivalent to `pitch_keycenter=69 lokey=69 hikey=69`

When read, Equator will pitch bend the sample to be in key with the note value triggered.

Multiple Regions

Now you add another audio file: bass_A3.wav. You want to play this new sound when any key up to C4 is hit and play the original flute sound for any key above C4.

The order of the regions is arbitrary.

```
<region> sample=bass_A3.wav  pitch_keycenter=57  lokey=0  hikey=60

<region> sample=flute_A4.wav pitch_keycenter=69  lokey=61 hikey=127
```

Regions can overlap; in this case, certain notes will trigger more than one audio file. The maximum number of files that can be simultaneously triggered in **Equator** is currently 10.

Velocity Layers

Samples can also be layered by using velocity. To achieve this the velocity range can be defined by setting the region for each sample. For example if you had two flute samples at the same pitch but with different timbres, the following SFZ could be written:

```
<region> sample=flute_A4_quiet.wav
      pitch_keycenter=69  lokey=0  hikey=127
                          lovel=1  hivel=63

<region> sample=flute_A4_LOOUUD.wav
      pitch_keycenter=69  lokey=0  hikey=127
                          lovel=64  hivel=127
```

Looping

Some samples may need to be looped so that they are sustained until the note is released. A looped section of a region can be defined by the `loop_start` and `loop_end` keywords as shown below:

```
<region> sample=flute_A4.wav
      pitch_keycenter=69  lokey=0  hikey=127
      loop_start=162788   loop_end=430658
```

Some audio files (WAV, AIFF) contain loop information themselves. This will only be used if the SFZ file doesn't contain loop information for that file, otherwise it will be ignored.

Random Triggering

To introduce some variation (and avoid the "machine gun effect" of repeating the same sample) random triggering can be used. Let us assume we have four snare samples which are slightly different. We can introduce random triggering by the `lorand` and `hirand` keywords:

```
<region> sample=snare1.wav  key=69  lorand=0    hirand=0.25

<region> sample=snare2.wav  key=69  lorand=0.25 hirand=0.5

<region> sample=snare3.wav  key=69  lorand=0.5  hirand=0.75

<region> sample=snare4.wav  key=69  lorand=0.75 hirand=1
```

Whenever a new note is hit, the sampler generates a random number between 0 and 1 and compares it to the `lorand` and `hirand` values of each relevant region. If the number is greater than or equal to `lorand` and smaller than `hirand` (except for `hirand=1` for which equality also passes the test) the region will be triggered.

Getting Equator to See a Sample Pack

Once your files are ready, please follow these instructions to get **Equator** to see your samples.

Create a folder with the name of the sample instrument, and place your samples and your SFZ file into it (this step is optional but it helps keeping your sample instruments organised).

You can then move or copy them in into **Equator's** sample folder. The location of this folder for Mac and Windows are:

Mac:
Mac [User]/Documents/ROLI/Equator for RISE/Samples/

Windows:
c:/Users/[User]/Documents/ROLI/Equator for RISE/Samples/

Your new sample instrument will appear in the Sample Module's drop-down menu after the factory content. Its name will be the same as that of the SFZ file.

An exclamation mark next to the name indicates that the sample instrument could not be fully loaded (e.g., because of an error in the SFZ file, a missing sample etc.).